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FOURTH ALL-UNION CONFERENCE ON SPACE BIOLOGY AND MEDICINE

Anonymous

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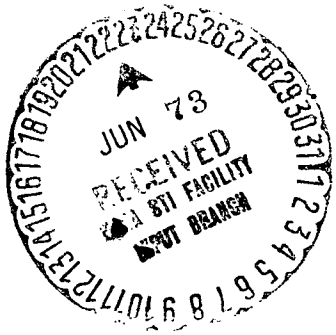

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FOURTH ALL-UNION CONFERENCE ON SPACE BIOLOGY AND MEDICINE

N. Gurovskiy, Doctor of Medical Sciences, and M. Kozar', Candidate of Medical Sciences, outlined the topics discussed at the Fourth All-Union Conference on Space Biology and Aviation Medicine held in Kaluga in accordance with a resolution by the Office of the Department of Physiology, USSR Academy of Sciences (see Library of Congress, FRD's earlier Items No. 1067 and 1048). In three Plenary and 24 Section meetings, 254 reports were delivered.

O. Gazenko, Corresponding Member of the USSR Academy of Sciences, opened the Conference by summarizing the basic results in the development of space biology and aerospace medicine in the three years since the Third All-Union Conference.

Increased interest was devoted to the question of the formation of the gaseous environment of spacecraft, the physiology of respiration and circulation, the toxic action of oxygen, the narcotic action of inert gases, etc.

P. Gramenitskiy spoke on the physiological basis of efficient cabin atmospheres.

G. Gurvich, V. Martens, V. Baranov, et al, emphasized the effect of neuroemotional stresses in ground conditions on external respiration.

Three special Section meetings discussed the medical support of prolonged piloted space flights.

G. Kassil' excited discussion with his talk on the intimate mechanisms of response reactions by the body to various influences as a function of circadian rhythms.

T. Krupina and others discussed the prognosis of possible functional changes and illnesses in prolonged spaceflight, and advised that in-flight measures be incorporated to aid in the prevention of traumatic injuries.

Yu. Bel'skiy created much interest with his paper on the influence of space factors on hemogram indices. Changes in the hematological indices in normal subjects under normal conditions during the different phases of the solar-activity cycle proved useful in determining the normal hemogram values.

The conference also evaluated new medical problems resulting from prolonged space flight.

On allergy during prolonged flight, T. Krupinaya, et al, showed possible steps in sensitizing cosmonaut's bodies in flight.

I. Bryanov, et al, and M. Korotayev, et al, considered the physiological aspects of special cosmonaut training.

A. Barer, et al, presented interesting data on human energy expended when walking under conditions simulating a decreased force of gravity equivalent to lunar conditions.

In a review paper, Yu. Nefedov, et al, presented the main results of medical and biological investigations performed in the flight program of Soyuz-type spacecraft, including cardiovascular reactions under weightlessness and post-flight body changes. They showed that studies from the Soyuz program have made it possible to achieve space flight up to one month in length without the creation of artificial gravitation aboard the craft.

L. Kakurin, et al, in a general paper, evaluated the results of medical investigations performed during the flight of the scientific orbital station Salyut.

Sessions of the Section on "Radiobiological Aspects of Space Flight" dealt with body reactions as a function of the physical conditions of irradiation and the initial state of the body.

Several papers dealt with the modelling of efficient conditions during prolonged space flight.

Sessions of the Section on "Life-Support Systems" dealt with the physico-chemical and biological synthesis of food, the creation of water-supply systems based on water regeneration from moisture-containing products, the study of environmental microflora and their control, and the improvement of cosmonaut personal hygiene means.

The importance of maintaining a normal balance between the different forms of environmental microorganisms was noted.

Many papers reported on the results of studies of the action of gravitational forces (Ye. Shul'zhenko, et al).

P. Vasil'yev et al, stimulated interest with a problem paper on the influence of the initial functional state on human tolerance to accelerations, including effects on the CNS and neuro-emotional sphere, and boosting working capacity by the use of pharmacological agents.

The Section on "Aerospace Toxicology" dealt with the toxicity and normalization of chemical agents which are the products of human metabolism (S. Gorodinskiy, A. Sedov, et al).

Motion sickness and decreased statokinetic stability were treated by G. Komendantov, et al, in a paper "On the pathogenesis of motion sickness," including discussion of phasal nature, summation of stimulations, and the sympathetic nervous system.

L. Chernikova examined the role of the self-regulatory mechanism of the nervous system and the reticular formation.

Numerous papers dealt with the auditory analyzer under constant intense noise (I. Bryanov, et al).

The Section on "Methods of Investigation in Aerospace Medicine" dealt with questions of information in experimental and flight conditions, analysis of experimental information including the use of computers, and methods for dosing experimental influences.

Papers on flight experiments on the Soyuz craft stimulated a great interest. Several instruments presently in use were demonstrated, particularly that of V. Yakovlev for the biotelemetric monitoring of functions.

A distinguishing feature of all the talks was their emphasis on the creation of methods for investigating and offering early and very early diagnosis of various states arising under the influence of extremal factors. Mathematical and computer analysis of experimental materials was stressed, as this might reveal hidden diagnostic and prognostic information.

The current need for communications on regulating cosmonaut work and rest was pointed out (S. Stepanova, et al), as were the selection and study of cosmonaut personality and the use of natural experiments in investigative practice (B. Alyakrinskiy).

New data on the pathogenesis of human hyperthermia and regular phase changes in gas-exchange during thermal load were presented by Ye. Kuznets, et al, and A. Azhayev. Interesting results concerning variations in heat exchange under conditions of prolonged stays in small sealed cabins and the influence of the gravitational factor on temperature homeostasis were reported on by Ye. Kuz'micheva, et al, and V. Klimovitskiy.

For the first time, the Conference examined questions related to the medical support of flight and technical crews by Civil Aviation, and independent Civil Aviation work on cabin hygiene, etc. Much attention was also devoted to problems of feeding the cosmonauts, particularly the development of food rations for prolonged flights (V. Bychkov, et al). Materials were presented by M. Sobakin, et al, on the state of the motor function of the stomach of cosmonauts after an 18-day flight in the Soyuz-9 craft. Data were presented by I. Popov, et al, on human water exchange during simulation of weightlessness. The problem of feeding during prolonged space flights will be successfully solved only through the close creative contact of physicians, biologists, and engineers.

Conference participants expressed their support of the expediency of organizing an All-Union Society of Space Biology and Aerospace Medicine.

J. Rowe
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